

**TAX REFORM: ITS EFFECTS ON THE OIL AND GAS INDUSTRY**

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## SUMMARY

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The taxation of oil and gas producers has long been the source of heated debate among economists, industry professionals, and policymakers. Recent discussions over comprehensive tax reform have again raised several issues regarding the taxation of the industry. Most important, special tax code provisions, including percentage depletion and the immediate write-off of drilling costs, have been criticized by some as unwarranted subsidies to oil and gas producers. As such, their repeal has been advocated by some proponents of comprehensive tax reform. Others see them as important incentives for domestic energy production. This study reviews the current tax treatment of oil and gas producers and discusses two proposals in depth--the Treasury Department's report on tax reform (Treasury I)<sup>1/</sup> and the President's recent tax reform proposals to the Congress (President's proposal).<sup>2/</sup> Some incremental changes in the current tax system are also briefly discussed.

Present tax law distinguishes among three types of capital costs incurred prior to the production of oil and gas. These are: (1) depletable costs related to determining the location of oil and gas prospects and acquiring of mineral rights, (2) costs of depreciable equipment used to drill wells and produce oil and gas, and (3) intangible costs incurred in the drilling of wells. (Intangible drilling costs are costs such as labor or materials used in the drilling of a well that have no salvage value once the well is abandoned.) Under current law, depletable costs are recovered through cost depletion or percentage depletion; depreciable costs are recovered through depreciation under the Accelerated Cost Recovery System (ACRS); and intangible drilling costs are expensed.

The provisions for percentage depletion and the expensing of intangible drilling costs are viewed as subsidies to the oil and gas industry because they allow producers more generous cost recovery than would be allowed under a capital recovery system based on economic lives. (A capital recovery system based on economic lives would allow producers to recover their investment costs only as their oil and gas properties' reserves were ex-

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1. U.S. Department of the Treasury, Tax Reform for Fairness, Simplicity and Economic Growth (November 1984).
  2. The President's Tax Proposals to the Congress for Fairness, Growth and Simplicity (May 1985).



hausted.) Although not specific to the oil and gas industry, the current tax provisions for depreciable equipment--accelerated depreciation and the investment tax credit--also extend more generous treatment to assets than would be allowed under a cost recovery system based on economic lives. This study shows that the net result of these provisions under current law is an effective corporate tax rate for oil and gas producers lower than that for other industries.

The original Treasury proposal would have completely repealed the provisions for percentage depletion and the expensing of intangible drilling costs. Instead, these costs would be recovered under cost depletion, indexed for inflation. The current system of depreciation would be replaced by a new system based on economic lives, and the investment credit would be repealed. Top corporate and individual rates would be reduced to 33 percent and 35 percent, respectively. The proposal also would have repealed the Windfall Profit Tax as of January 1, 1988. If adopted, these proposals would have substantially raised the tax rate on the oil and gas extraction industry and narrowed the gap between the industry's effective tax rate and that for other industries. Indeed, one of the main goals of Treasury I was to be as neutral as possible among firms in different industry sectors. This policy could, however, result in reduced drilling and oil and gas production from domestic sources.

The President's proposals subsequently modified the Treasury proposals to allow for continued expensing of intangible drilling costs. The President's proposals would also continue percentage depletion for wells that produce less than 10 barrels of oil per day. The depreciation system is more generous than that proposed by the Treasury, but the investment tax credit would still be repealed. The plan also contains an alternative minimum tax on certain tax preferences--including percentage depletion and intangible drilling costs--that was not deemed necessary under the Treasury plan. The Windfall Profit Tax would also be continued until its scheduled repeal in 1994. The net result of these changes would be to lower somewhat the effective corporate tax rates for many industries, including the oil and gas industry. The oil and gas industry would continue to be favored under the President's plan relative to other industries. As a result, the President's plan would be unlikely to have any detrimental effect on the overall level of drilling and production in the United States.

#### Energy Policy Considerations

The proposed changes in tax law could have effects on domestic oil supply: changes that increase the taxation on income from marginal oil and gas investments will discourage domestic oil and gas





production. To the extent that domestic oil production would be reduced, the United States would have to import more of its oil. (In 1984, the United States imported about 30 percent of its petroleum needs; about 5 percent coming from Middle Eastern OPEC countries.)

Increased U.S. oil imports could raise concerns over oil supply vulnerability. In the short run, this concern does not seem warranted since there is significant excess production capacity in the international petroleum market. It is unlikely that any embargo by one or several foreign suppliers would have a significant effect on United States ability to fulfill its import requirements. Moreover, at current import levels, the Strategic Petroleum Reserve could fully replace imports for about 100 days.

Over the long run, some argue, the power of foreign suppliers (OPEC in particular) to affect world oil prices may become substantially greater than at present. This is because those countries have a significant percentage of proved oil reserves; at current production rates, this percentage will rise over time. In this view, it is necessary for the United States to provide tax incentives to increase domestic exploration, development, and production. The tax provisions for expensing of intangible drilling costs and percentage depletion are among those incentives. The President's proposal embraces the view that the expensing of intangible drilling costs is necessary to avert increased dependence on foreign energy that would "again make the United States vulnerable to concerted political or market action by foreign energy producers."<sup>3/</sup>

This view has been questioned by some who argue that increasing domestic production is tantamount to a policy of "draining America first." They argue that potential United States reserves should be stored (or merely not produced) and that it is cheaper to buy imports at currently depressed world market prices. Furthermore, they argue that the U.S. needs to save its reserves in case imports should become unavailable in the future, for whatever reason.

Others argue that domestic petroleum should neither be subsidized nor penalized. This implies that the oil and gas industry should be taxed at the same rate as other industries. The market, rather than the tax system, would then be the final arbiter as to how the economy's resources were allocated. Capital and labor would be directed to their most efficient uses.

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3. The President's Proposals to the Congress for Fairness Growth and Simplicity, p. 232.



Further, some argue that even if it is desirable to avoid heavy reliance on foreign oil suppliers, an oil tax or import fee is a better solution than a production subsidy. Because an oil tax or import fee would reduce oil consumption (through fuel switching or conservation) by raising its price, dependence on foreign suppliers would be reduced. Moreover, in the case of an import fee, domestic production of oil (and other fuels) would simultaneously be encouraged. As a further protection, the revenue from such a tax could be used to fund directly the Strategic Petroleum Reserve.<sup>4/</sup>

This paper is in four parts: the first part presents some general information on the structure and organization of the oil and gas industry; the second part discusses the current taxation of oil and gas producers and the changes that have been proposed; the third part examines the overall effects of these proposals on different oil investments; and the fourth part discusses the effect that each proposal might have on domestic oil and gas production in future years. Other proposals for changing the taxation of oil and gas producers are also discussed.

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4. See Congressional Budget Office, Charging for Federal Services (December 1983).



## CHAPTER I.

### STRUCTURE AND ORGANIZATION OF THE INDUSTRY

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The oil and gas extraction industry is engaged in the process of finding, developing, and producing crude petroleum and natural gas.<sup>5/</sup> This process starts with geological surveys and seismicographic testing to identify possible oil-bearing land. Once a prospect has been identified, producers negotiate (or bid for) a lease from the mineral rights holder (usually the landowner). Leases are generally characterized by one-time up-front "bonus" payments in return for the opportunity to explore for oil and gas reserves. In addition to the bonus, a lease usually contains a provision that if reserves are subsequently discovered and produced, the leaseholder will receive a percentage share of the gross revenue (or production in kind). This revenue-sharing payment is generally referred to as a royalty; the share is often in the range of one-eighth to one-sixth of gross production.<sup>6/</sup>

Once a firm has obtained the right to explore for oil and gas, further geological testing is done to establish the best sites for drilling exploratory wells. The riskiest form of exploratory well is known as the "wildcat" well. This type of well is drilled in an area that has not already proved to be productive.<sup>7/</sup> One or several exploratory wells are drilled on a property to determine whether the land contains sufficient deposits of oil and gas to make further development and production economic. (Oil and gas reserves are considered economic if the present discounted value of sales revenue is greater than the present value of future costs of development and production.) If it is decided that insufficient reserves exist, the property is abandoned as uneconomic.

Should oil and gas reserves be found such that further development is warranted on economic grounds, the firm will drill further development wells in order to tap the reserves. Drilling

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5. For the purposes of this paper, further petroleum-related activities, such as refining and marketing, are excluded from consideration.
  6. Royalties for federal offshore lands typically are one-sixth of production.
  7. A wildcat well is defined as a well drilled into a geological formation that is at least two miles from an already productive property. About 15 percent to 20 percent of wildcat wells are considered successful.



an oil well involves sinking a hole of from less than 1,000 feet to more than 20,000 feet. At present, costs of drilling can range from \$50,000 to more than \$4 million. Drilling time also varies substantially: from less than one month to many months.

Once a well is drilled, equipment must be installed (for example, tanks, pumps) to lift the oil and gas out of the ground and send it on its way to the purchaser, usually a refinery in the case of oil. In the early stages of an oil reservoir's life, the natural pressure of the surrounding formation is usually sufficient to provide the impetus to push the oil out of the ground.<sup>8/</sup> In the later stages of a reservoir's life, the pressure declines and some means of artificial lift (pumps) must be used.

The natural pressure of a formation influences the rate of production and the spacing of wells. In general, the faster a reservoir is depleted (through closer-spaced wells or faster flow rates), the faster the natural pressure will decline; this can reduce the ultimately recoverable reserves. The producer faces a trade-off between more rapid depletion (and higher current revenue) and slower depletion (and more future revenue). This production decision is dictated by the geophysical properties that characterize the reservoir and by economic factors, such as expected future prices and interest rates.

In general, producing wells usually exhibit a time profile that is characterized by high initial production diminishing at a relatively constant rate over time. In the later stages of a well's life, it turns into a "stripper" well--that is, a well that produces less than 10 barrels per day.<sup>9/</sup> The well is finally capped and abandoned when the revenue from production is not sufficient to cover its continued operating costs. This point is referred to as the "economic limit" of a well.

The oil and gas extraction industry is very capital-intensive relative to other industries. The production process involves large up-front capital expenditures in the form of bonus payments, drilling costs, and depreciable equipment, but relatively small

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8. Oil and gas reserves are found in porous rock in certain types of geological formations. Contiguous formations of oil- and gas-bearing rock are referred to as reservoirs or pools.
  9. Some marginal wells may even start out as stripper wells, or become stripper wells in less than one year.





current operating expenses.<sup>10/</sup> Most of the sales price per barrel of production is required to pay investors (stockholders, bondholders or other lenders) for the use of their financial capital. Because the industry is so capital-intensive, taxes on capital income are likely to have significant effects on the relative attractiveness of investments in the oil and gas industry. Moreover, changing the tax system that now is in place could have significant effects on domestic oil and gas production in the United States.

### The Participants

The oil and gas industry includes a wide variety of participants--from large multinational corporations to passive investors. A number and range of parties usually have an economic interest in any given oil property. Partnerships and joint ventures are common, used both to raise capital and to share risks among producers. Although there may be a number of separate economic interests in a given property, usually only one firm does the actual drilling and production. This partner or operator is responsible for conducting the exploration, production, and distribution operations (it may, however, contract with other firms to perform these activities).

In 1982, the top 32 oil and gas companies (mostly integrated producers)<sup>11/</sup> produced about 76 percent of domestic oil and 59 percent of natural gas. Independents (all oil and gas companies other than the top 32 ranked by the value of production) accounted for about 24 percent of the oil and 41 percent of the natural gas produced domestically (see Table 1). The "independents" can be divided into two groups--large and medium-sized corporations that are similar to the majors, and a large number of smaller corporations, proprietorships, and partnerships. Firms other than the top 400--that is, firms other than the majors or the larger independents--produced about 10 percent of the oil and 14 percent of the natural gas in the United States. Although production is dominated by the larger firms in the industry, a number of small firms compete on the fringe. According to Department of Commerce

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10. For example, according to the Annual Survey of Oil and Gas, direct operating costs (exclusive of taxes and overhead) averaged about 15 percent of production revenues in 1982. In the initial years of a property's production, operating costs are likely to be much lower, only to rise to higher levels in later years.
  11. An integrated producer is one who also is engaged in refining and distribution of petroleum.



TABLE 1. OIL AND GAS INDUSTRY STATISTICS, BY CATEGORY OF COMPANY

	Percentage Distribution					
	Total United States <sup>a</sup>	Integrated Companies (Top 32)	Large Indepen- dents (Next 168)	Medium Indepen- dents (Next 200)	Small Indepen- dents (Others) <sup>b</sup>	Non- Operating Interests <sup>c</sup>
Gross Revenue (\$ billions)	134.6	67.6	18.0	6.2	8.3	0.0
Net Revenue (\$ billions)	134.6	53.8	10.4	2.1	8.6	25.2
Gross Oil Production (millions of bbls)	3,083.2	76.2	9.5	3.9	10.4	0.0
Net Oil Production (millions of bbls)	3,083.2	64.7	5.4	3.2	6.5	20.2
Gross Stripper Production <sup>d</sup> (millions of bbls)	372.6	48.5	11.2	9.4	30.9	0.0
Net Stripper Production <sup>d</sup> (millions of bbls)	372.6	39.7	4.4	6.9	21.2	27.8
Gross Natural Gas Production (trillions of cubic feet)	19.0	58.8	23.3	4.3	13.6	0.0
Net Natural Gas Production (trillions of cubic feet)	19.0	43.8	16.0	3.2	8.2	28.8
Net Production per Day per Firm (barrels per day) <sup>e</sup>		289,439	10,459	2,717	152	
Drilling:						
Gross expenditures (\$ billions)	38.5	47.5	27.2	na	25.3 <sup>f</sup>	0.0
Net expenditures (\$ billions)	38.5	40.4	16.8	na	16.9 <sup>f</sup>	25.9
Gross wells completed (thousands)	63.6	21.1	17.4	na	61.6 <sup>f</sup>	0.0
Net wells completed (thousands)	63.6	16.8	13.0	na	43.0 <sup>f</sup>	27.2
Gross well footage (millions of feet)	358.5	25.9	21.3	na	52.8 <sup>f</sup>	0.0
Net well footage (millions of feet)	358.5	20.8	15.6	na	37.0 <sup>f</sup>	26.7

SOURCES: U.S. Department of Commerce, Bureau of the Census, 1982 Census of Mineral Industries: Crude Petroleum and Natural Gas (February 1985) and Annual Survey of Oil and Gas, 1982 (March 1984); and CBO estimates.

- a. Data exclude companies with no paid employees.
- b. 8,276 firms
- c. Includes limited partnership and royalty interests (including federal, state, and local governments).
- d. Total U.S. stripper production (including producers not included here) has been estimated at 442 million barrels.
- e. Includes natural gas computed as equivalent of 6,000 cubic feet per barrel.
- f. Includes both medium independents and small independents.



statistics, 8,676 companies were engaged in oil and gas extraction in 1982.<sup>12/</sup>

As mentioned above, the producing companies generally do not receive 100 percent of the revenue derived from their operations. In 1982, the top 32 companies produced 76 percent of the oil, but had an economic interest of only 65 percent. Similarly, the top 400 firms produced 90 percent of the oil, but had an estimated net interest of 73 percent. The differences between the gross and the net interests reflect royalties and payments to landowners, including federal, state and local governments.

On average, the top 32 firms produced 289,439 barrels per firm per day (net) of oil and natural gas (on an oil-equivalent basis). In contrast, firms other than the top 400 averaged only 152 barrels per day (per firm) of oil and gas production. Stripper production (oil from wells that produce less than 10 barrels per day) was about 12 percent of oil production; the top 400 firms produced 69 percent of this amount.<sup>13/</sup> On a net interest basis, these firms produced about 51 percent of stripper production. Of the 825,242 producing oil and gas wells in 1983, 441,501 (54 percent) were stripper wells.

In general, most oil is produced by corporations. In 1982, corporations produced 94 percent of the oil and gas on a gross basis. Sole proprietorships were responsible for about 2 percent and partnerships produced about 1 percent. These shares are gross amounts produced by the firms, regardless of who owns the actual economic interest in the production. On a net basis, the producing corporations have an economic interest of 75 percent as compared to their 94 percent share of gross oil production. Sole proprietorships and partnerships each have about a 1.5 percent net interest in oil production. Non-producers have net interests in oil of about 20 percent and in natural gas of 29 percent. These interests include parties outside the operating segment of the industry, such as individual royalty holders, limited partners, and landowners (including governments and corporations not engaged in the production of oil).

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12. Companies without paid employees are excluded.

13. These statistics only relate to operating companies (with payrolls). Taking all producers into account, stripper production is about 15 percent of total U.S. production. The top 32 firms account for about 41 percent of this amount.



Drilling and Exploration

The independents play a more important part in drilling and exploration than in production. Of the \$38.5 billion spent on drilling in 1982, 53 percent was spent by firms other than the top 32 companies. Firms other than the top 200 spent 25 percent compared to their 15 percent share of gross lease revenues. While the large oil and gas corporations spend more for exploration and development wells than the smaller firms, drilling of wells is done mostly by smaller firms: firms other than the top 200 drilled 62 percent of the total wells completed during 1982. Larger firms generally drill deeper and more costly wells than the independent firms. The top 32 firms completed wells averaging about 6,900 feet in depth, at \$197 per foot; firms other than the top 200 completed wells averaging about 4,800 feet and costing \$51 per foot. In large part, this reflects the greater activity of the large companies in offshore areas.





## CHAPTER II.

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### CURRENT TAX TREATMENT OF OIL AND GAS VENTURES

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Present law distinguishes among three types of capital costs incurred by oil and gas producers: (1) costs incurred prior to drilling; (2) drilling costs; and (3) equipment and machinery used for the drilling of wells or the production of oil and gas. Pre-production costs include those associated with acquiring the mineral rights to search for oil and gas. These costs usually include lease bonuses that are paid to the landowner; for example, companies pay sizable amounts to the federal government for rights to search for oil in the outer continental shelf. In addition to acquisition costs (primarily lease bonuses), there are costs associated with exploration. These include seismic surveys and geological testing and mapping. Both mineral rights acquisition costs and exploration costs are referred to in the tax code (for oil and gas producers) as depletable costs; that is, they can be recovered by depletion as defined by the tax law. The second type of cost associated with an oil and gas venture is intangible drilling costs. These are costs that relate to the drilling of the well and its preparation for production; they include labor, materials, energy, and other expenditures that have no salvage value. These are generally referred to as capital costs because they occur prior to production and are associated with future revenue over the life of the property. The third type of capital cost is for equipment and machinery, such as pumps, tanks or flow-lines, that can be readily used for other wells (or other purposes). These costs are referred to as depreciable costs. Operating expenses related to actually producing the oil and/or gas, like other operating costs, are deductible as ordinary business expenses.

For 1982, the Annual Survey of Oil and Gas reports that for the oil and gas industry as a whole \$14 billion was spent on depletable assets, about \$31 billion on intangible drilling costs, and about \$5 billion on depreciable assets.<sup>14/</sup> Due to the wide variety of oil and gas investment projects across the country, however, large differences exist in the shares spent on each of the above categories. These large differences in the composition of capital costs make it very difficult to assess how changes in the tax structure are likely to affect specific producers.

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14. The Annual Survey of Oil and Gas presents the most detailed annual set of statistics on the oil and gas industry. The 1982 data are the latest available; the survey was discontinued after that year.